**Excel Technologies Ltd.**

**Competency Assessment**

Position: Software Engineer

Total Marks: 30

*Ensure you are indicating accurately what question you are answering. Make sure your script is clean and easily readable. Do not forget to fill up the box below with your information. Attach the question paper with you script. During competency assessment, you are not allowed to use internet through any means.*

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| Name | N | A | B | I | L |  | S | A | R | W | A | R |  | R | A | H | A | T |  |  |
| Cellphone | 0 | 1 | 5 | 7 | 5 | 4 | 8 | 3 | 1 | 0 | 0 |  |  |  |  |  |  |  |  |  |
| Email | p | n | e | w | 8 | 7 | 3 | 3 | 8 | @ | g | m | a | i | l | . | c | o | m |  |

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|  |  | Marks |
| 1 | Consider the following register. Holy Family Red Cross Hospital is using this register to manage doctors’ list, their contact number, and the departments where the doctors are belongs to. With this register, the hospital is also managing doctor’s service points within the hospital.   1. Apply normalization rule to normalize this register up to 3rd normal form. 2. After normalization, draw Entity Relationship Diagram and show the degree of cardinality among entities using crow’s foot notation.  |  |  |  |  | | --- | --- | --- | --- | | **Doctor** | **Contact Number** | **Service Points** | **Department** | | Dr. Lissa Mwenda | +260766219936 | Antenatal Care, Family Planning, Postnatal Care | Gynecology | | Dr. Yvonne Sishuwa | +260766219937 | Family Planning, Postnatal Care | Pediatrics | | Dr. Machalo Mbale | +260766219938 | Antenatal Care | Radiology and Imaging | | 5 X 2 = 10 |
| 2 | Consider the following loop. Trace the value of “n” in every iteration of the loop.  int n = 30;  for (int i = 0; i <= 5; i++)  {  n += i;  }  print(n);  **Ans : 30,31,33,36,40,45** | 5 |
| 4 | Explain method overloading and method overriding with example. Write your code in C# programming language.  Ans : Method Overloading means same name of the function but having different set of arguments .  Example :  public class Calculator  {  public int addition(int a, int b)  {  return a + b;  }  public int addition(int a, int b, int c)  {  return a + b + c;  }  }  Method Overriding : Parent child classes having method of same name and same set of arguments ,in this case child instance calls his own implementation if the reference is of child objects.  public class BaseClass  {  public BaseClass()  {  }  public int Mehod(int a)  {  return a++;  }  }  public class ChildClass : BaseClass  {  public ChildClass()  {  }  public int Mehod(int a)  {  return a--;  }  }  BaseClass b = new ChildClass();  b.Method(4); /// calls child implementation returns 3 | 5 |
| 5 | Translate the following UML Class Diagram into program code. Write your code in C# programming language. | 5 |
| public class Clinician  {  public string Name { get; set; }  public string HospitalName { get; set; }  public bool Login(string username, string password)  {  if (username == "admin" && password == "admin")  {  return true;  }  return false;  }  private bool IsSessionExists()  {  return true;  }  }  public class Doctor : Clinician  {  public string PracticeNumber { get; set; }  public void CreatePrescription(int PatientNumber)  {  Console.WriteLine("Prescription Created. Patient Number {0}", PatientNumber);  }  } | | |
| public class Pharmacist : Clinician  {  public string PharmacistNumber { get; set; }  public void DispenseMedications(int PrescriptionNumber)  {  Console.WriteLine("Medications Dispensed. Prescription Number {0}", PrescriptionNumber);  }  } | | |
| 6 | Translate the UML Activity diagram into program code. Write your code either in C# programming language. | 5 |
|  | | |

public static void Calculate()

{

int n1 = Convert.ToInt32(Console.ReadLine());

int n2 = Convert.ToInt32(Console.ReadLine());

int n3 = Convert.ToInt32(Console.ReadLine());

int min = 0;

if (n1 < n2)

{

min = n1;

}

else

{

min = n2;

}

if (n3 < min)

{

min = n3;

}

else

{

Console.WriteLine(min);

}

}

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